

# XCLAIM™ 3D

## User's Guide

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# Table of Contents

<b>1. Getting Started.....</b>	<b>1</b>
Introduction.....	1
What's in the Package .....	2
What You'll Need .....	2
Related Documentation .....	2
<b>2. Installing Your Hardware.....</b>	<b>3</b>
Installing your XCLAIM 3D.....	4
About Monitor Sensing .....	9
<b>3. Installing Your Software.....</b>	<b>11</b>
About ATI Software .....	11
Installing Software .....	11
ATI Displays Control Panel .....	14
ATI Guide .....	17
Customer Support .....	18
<b>4. Multimedia Features.....</b>	<b>19</b>
Using QuickTime Playback.....	19
Viewing 3D Graphics.....	21
<b>A. Troubleshooting Tips.....</b>	<b>25</b>
Before Contacting Customer Support .....	25
Solutions to Common Problems.....	25
<b>B. Specifications.....</b>	<b>29</b>
Video Mode Table .....	29
3D Mode Table.....	30
Memory Upgrade .....	30
Specifications.....	31
<b>C. Compliance Information .....</b>	<b>33</b>



# 1 Getting Started

## Introduction

XCLAIM 3D represents the next generation in 3D rendering and video acceleration for your PCI Macintosh. Equipped with all the 3D hardware drawing capabilities in demand by 3D designers, your new graphics accelerator is three products in one:

- QuickDraw 3D accelerator providing superior 3D rendering performance and advanced imaging and filtering techniques
- QuickDraw accelerator supporting resolutions up to 1600x1200 with thousands of colors, and millions of colors with up to 1280x1024
- QuickTime playback accelerator for full screen, full motion, TV quality video

The ATI Displays control panel provides quick access to all of XCLAIM 3D's easy-to-use features, and you have instant access to help using Apple Guide.

## What's in the Package

The XCLAIM 3D package contains the following hardware, software, and documentation:

- XCLAIM 3D card
- 3.5" installation disks and/or CD-ROM with the latest QuickTime and QuickDraw 3D software
- User's Guide

If any item is missing or damaged, immediately contact the dealer from whom the unit was purchased.


## What You'll Need

The XCLAIM 3D card runs with the following minimum system requirements:

- Power Macintosh with a PCI expansion slot
- Macintosh System software 7.5.2 or later
- Apple monitor or VGA-style monitor
- QuickTime 2.5 or later (included)
- QuickDraw 3D 1.5 or later (included)
- Minimum 16MB of system memory (QuickDraw 3D requires 16MB of system memory)

## Related Documentation

The README file summarizes the latest product revisions. Click the README icon on the installation disk to open this file.

The XCLAIM 3D card comes with ATI Guide, which provides online help about using the features of your card. Access the ATI Guide by clicking on the Apple Guide  icon on the ATI Displays control panel.

## 2 Installing Your Hardware

XCLAIM 3D fits into connectors called expansion slots, inside your computer.

Your Macintosh has one or more slots, each designed to accept Peripheral Component Interconnect (PCI) cards.



### WARNING

- The manufacturer assumes no liability for any damage, caused directly or indirectly, by improper installation of components by unauthorized service personnel. **If you do not feel comfortable performing the installation, consult a qualified technician.**
- Make sure power is off during installation; otherwise, damage to system components, the graphics accelerator card, and injury to yourself may result.



*The following procedure details the installation of a card in a typical Macintosh PCI tower. If your system does not match this configuration, please refer to your system documentation for expansion card installation instructions.*

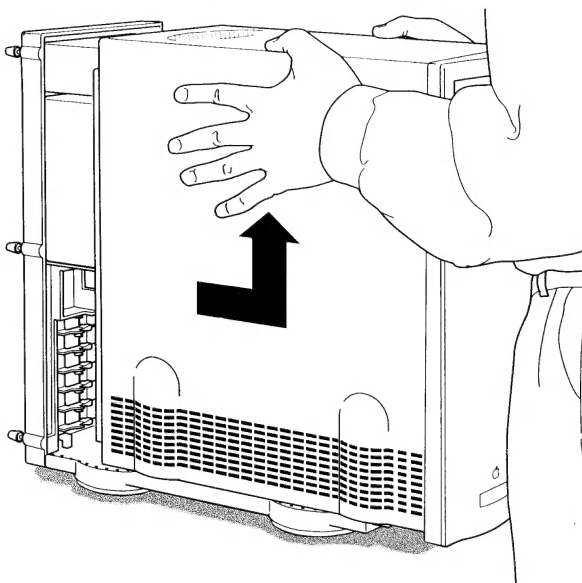


### IMPORTANT

- If your system hangs after installing the XCLAIM 3D card, you may have an old graphics accelerator extension that is incompatible with XCLAIM 3D
- Restart your Mac and hold down the SHIFT key during startup. This will disable all extensions from loading. Now you can update the graphics accelerator extension by installing the software included with your card. For more information about installing the software, see “Installing Software” on page 11.

## Installing your XCLAIM 3D

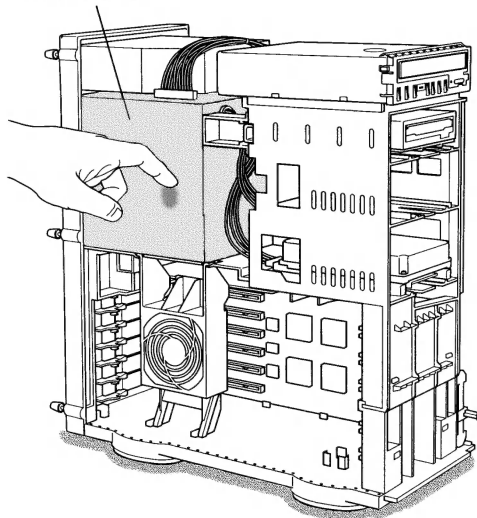
- 1 Turn off your computer, and disconnect the monitor cable.
- 2 Remove the computer cover. If necessary, consult your computer system manual for removal instructions.



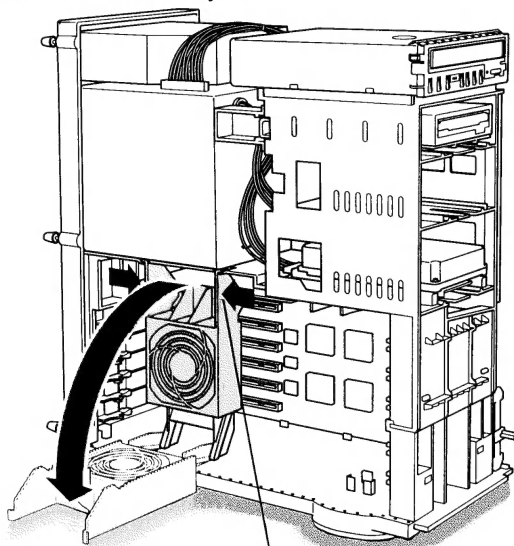


- 3 Choose the PCI expansion slot you wish to use.
- 4 Touch the metal part of the power supply case.  
*Touching the grounded portion of the power supply case will discharge your body's static electricity.*

Power Supply

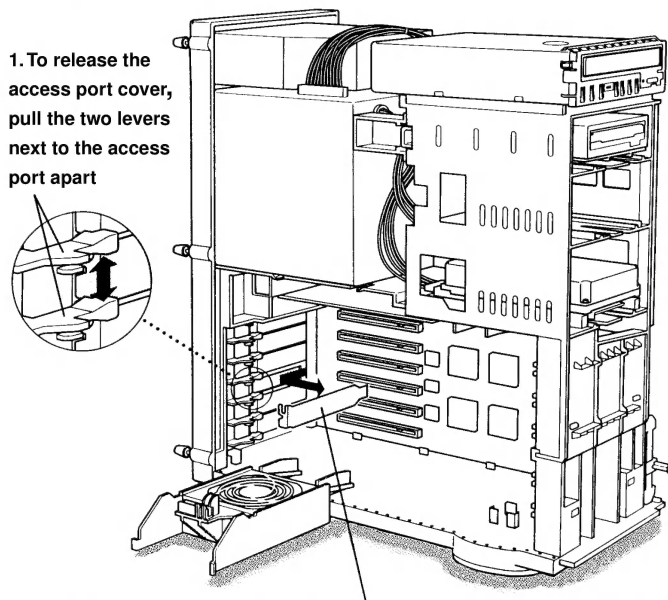


- 5 Lower the auxiliary fan.



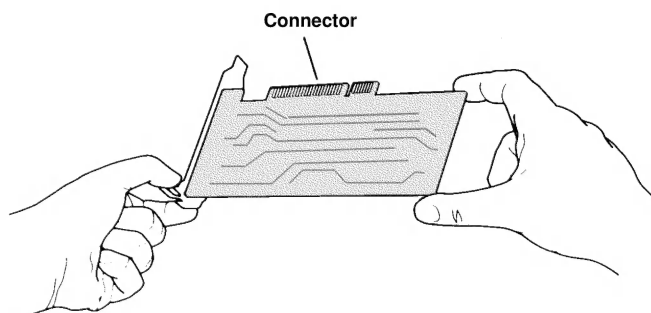
To lower the fan, squeeze the sides to unlatch it.

- 6 Remove the metal access cover from the expansion slot you want to use.

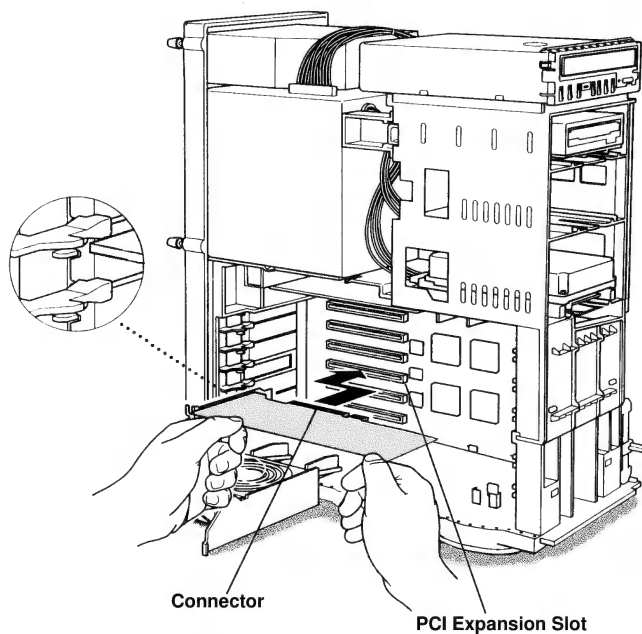


2. Slide the access port cover out and away from the access port.

- 7 Align the connector on the card with the PCI expansion slot and press firmly until fully seated.



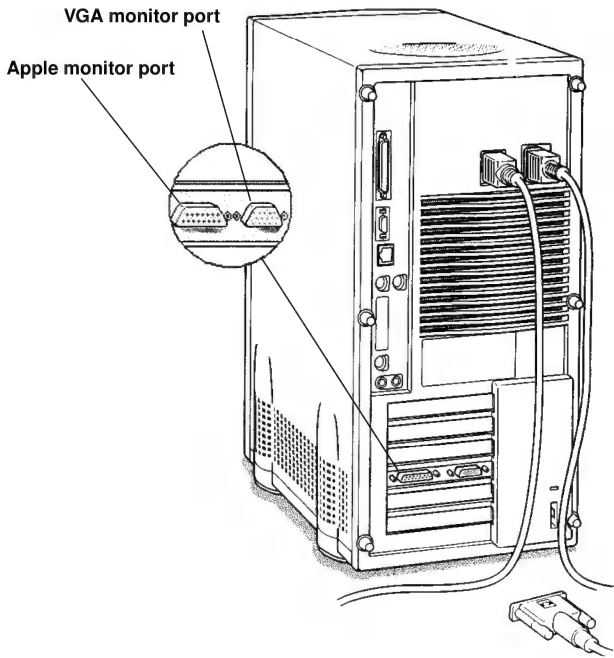
*Do not force the card. The card should fit snugly into the expansion slot.*



*If you plan to use multiple displays, you must install a card for each monitor. Repeat steps 6 and 7 for each card.*

- 8 Replace the auxiliary fan.
- 9 Replace the computer cover.

10 Connect the monitor cable to the card.



*If you have an Apple monitor, connect it to the Apple monitor port.  
If you have a VGA monitor, connect it to the VGA monitor port.  
**Only connect one monitor to the card.***



### WARNING

- Serious damage to your system may occur if you connect more than one monitor to the card. If you have more than one monitor, you **must** connect it to another graphics card.



*If your monitor is connected to the Apple monitor port, it must support Apple's Monitor Sense protocol, either directly or through an appropriate adapter. For more information, see "About Monitor Sensing" on page 9.*

Installation of your XCLAIM 3D card is now complete and you are ready to install the software. See "Installing Your Software" on page 11.

## About Monitor Sensing

Apple's Monitor Sensing specification allows graphics cards to identify the attached monitor. During startup, the XCLAIM 3D checks the status of three of the fifteen pins on the Apple monitor port. It then auto-configures itself according to the monitor sense code detected and enables all resolutions supported by the monitor. Since the XCLAIM 3D relies on this sense code to correctly auto-configure during startup, the monitor must supply the appropriate sense code.

In a case where your monitor does not directly supply the sense code information, an adapter can be used to set the appropriate sense code for your monitor. Typically, an adapter is used to connect a VGA monitor to the Apple monitor port, or to simply supply the correct monitor sense code information.

If the adapter supplies the sense code information for only one resolution, then that resolution will be the only one available, even if the monitor supports multiple resolutions. Therefore, when using an adapter to supply the sense code, it must be designed to supply the proper code for the monitor you are using it with; otherwise, the XCLAIM 3D cannot correctly auto-configure itself for the attached monitor.

Although the XCLAIM 3D card does not output Sync-on-Green (SOG) signals directly, adapters are available that can overlay the Composite Synchronization Signal and send it through the Green video signal line so that you can use an SOG monitor. Monitors requiring an SOG signal usually have only three BNC connectors (RGB).

For more information about obtaining a sense code or synchronization signal adapter, contact ATI Customer Support or ask your dealer. For information about how to contact ATI Customer Support, select the Support button on the ATI Displays Control panel.



# 3 Installing Your Software

## About ATI Software

XCLAIM 3D requires that several components be added to your System folder. The XCLAIM 3D Installer does this for you, installing the following components:



### ATI Displays Control Panel

The ATI Displays control panel lets you configure your card and access software and hardware features. These features are described later in this chapter.



### ATI Multimedia Extensions

ATI's Multimedia Extensions are placed in your system folder. They enable all of the advanced features of your card, including 3D and 2D acceleration, and QuickTime acceleration.



### ATI Guide File

The ATI Guide file is the online help for the ATI Displays control panel. It is placed in the Extensions folder within the System folder. For more information about using the ATI Guide, see "ATI Guide" on page 17.

## Installing Software

- 1 Insert the XCLAIM 3D installation disk into your disk drive.

or

Insert the ATI Installation CD-ROM into your CD-ROM drive.

2 Double-click on the XCLAIM 3D  Installer icon.

*The ATI splash screen appears.*



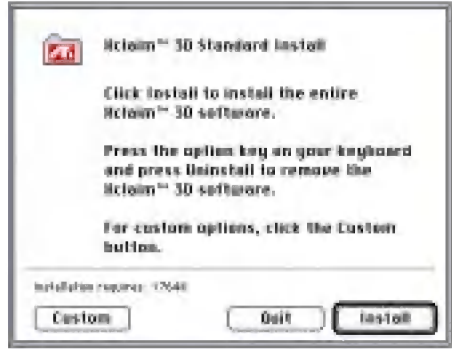
3 Click Continue.

*An ATI information and disclaimer screen appears.*



4 Click Continue.

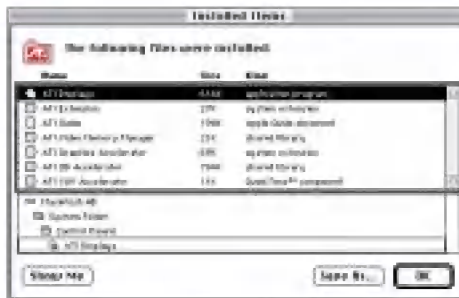
*The XCLAIM 3D Standard Install window appears. Click Custom to install only certain components.*





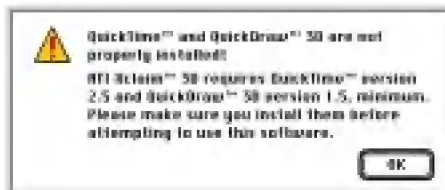
**5** Click Install.

Upon completion, a list of installed files appears. Click the Show Me button to locate where a file has been installed.

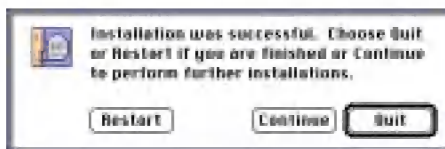
**6** Click OK.

The installer then determines if your system has the latest versions of the required software. If you do not have the appropriate Apple software, you are notified about what needs to be installed. The XCLAIM 3D Extras CD includes the latest Versions of QuickTime and QuickDraw 3D.

If this message appears, you need to install the latest version of QuickTime or QuickDraw.

**7** Click OK.

To complete the installation, you must restart your computer.

**8** If you are finished, click Restart.

Your system restarts.

or

To perform further installations, click Continue. The XCLAIM 3D Standard Install window appears.

or

To return to Finder, click Quit.

You need to manually restart your system to complete the installation of XCLAIM 3D's software.

## ATI Displays Control Panel

The ATI Displays control panel provides access to the advanced 3D features that XCLAIM 3D has to offer. To open the ATI Displays control panel, select Control Panels from the Apple menu, then select ATI Displays.

For detailed instructions on how to set up and use these features, please refer to the ATI Guide, which can be accessed through the ATI Displays control panel.



### Status Area

Look in the Status Area to determine your current monitor, screen resolution, and color depth. To change these settings, use the Monitors feature.



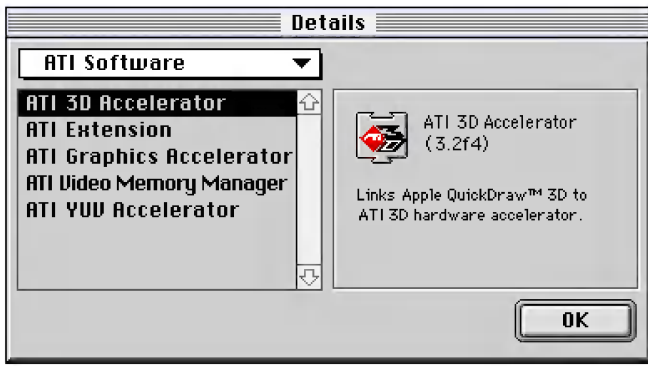
### Identify Displays

If you have more than one display connected to your system, you can identify and configure each display. The ATI Displays control panel will identify all the displays connected to your system, but will only configure displays that are connected to ATI cards.



### Display Details

The Details window gives you information about specific software components needed to enable each of XCLAIM 3D's features. Check the Details window to determine the files and version numbers of the software components installed in your system folder during the installation process. Using the pull-down menu, the Details window also lists the Apple system software required for XCLAIM 3D (QuickTime, QuickDraw 3D).



### Monitors

The Monitors feature provides access to the standard Apple Monitors control panel (or the Sound and Displays control panel on some Macs). You can use this panel to select color depths and resolutions, and set up multiple monitors. For more information on this panel refer to the Macintosh Guide that comes with your system.



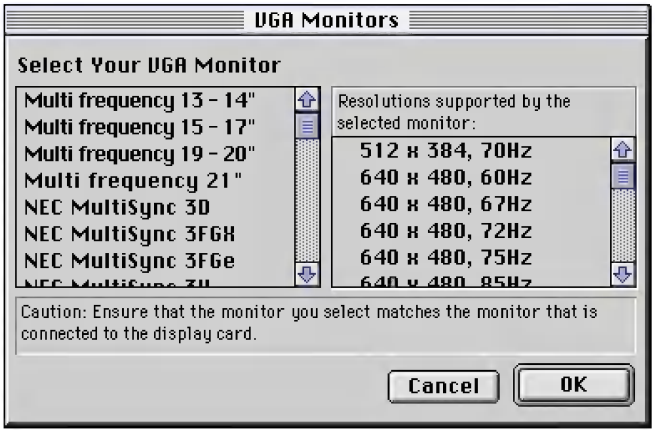
Keyboard Shortcuts

This feature allows you to use a pop-up menu to change your desktop settings without exiting your current application. You can configure, enable or disable shortcut features when you click the Shortcut icon in the control panel.



VGA Monitors

If you have a VGA monitor connected to your XCLAIM 3D card, you use the VGA Monitors feature to select your particular monitor from a list of standard monitors. For detailed instructions on selecting your monitor, please refer to the ATI Guide, which can be accessed through the ATI Displays control panel.





*If the VGA icon is dimmed, the system has detected an Apple-type monitor connected to your card, and no selection is necessary.*



### 3D Texture Compression

You can adjust the 3D texture compression using the 3D features included with XCLAIM 3D. Some 3D textures demand a significant amount of memory. To free up some memory you can use 3D texture compression. For more information about 3D texture compression, see “Viewing 3D Graphics” on page 21.




### 3D Memory Monitor

XCLAIM 3D supports advanced 3D features including mip maps, Gouraud shading, fog effects, and texture mapping. The 3D Memory Monitor shows how available memory in the accelerator card is allocated when displaying 3D graphics. For more information about 3D graphics and the 3D Memory Monitor, see “Viewing 3D Graphics” on page 21.



### ATI Guide

The ATI Guide is an additional source of information when you are working with the ATI Displays control panel. It behaves similarly to the Macintosh Guide that comes with your system.

Access the ATI Guide by clicking on the Apple Guide  icon on the ATI Displays control panel. The ATI Guide stays in front of other windows on the screen so the instructions are always visible. To move the ATI Guide window to another location, drag it by the title bar.

Select a topic from the main ATI Guide window to get detailed instructions for a specific task. To return to the main ATI Guide window, click the Topics icon in the lower-left corner of the Guide window. When you’re finished using ATI Guide, click the close box.



## Customer Support

You can obtain Customer Support information by clicking the ATI icon in the ATI Displays control panel. You can also generate a problem report. Please refer to the ATI Guide for instructions on generating a problem report.

Before calling about a suspected problem, please complete the problem report, and have the report file either on-screen or printed out for reference during your call. Important information about your system is automatically included when you generate the report.

## 4 Multimedia Features

Your XCLAIM 3D turns your PCI Mac into a 3D and 2D graphics powerhouse. You can use your new graphics accelerator card to do the following:

- Watch full screen, full motion, TV-quality video using QuickTime playback acceleration
- Render 3D worlds and animation in real time, using embedded 3D hardware drawing capabilities
- Enjoy true-color performance up to 1280x1024, and thousands of colors at 1600x1200
- Develop high-performance, high-resolution, true-color 3D graphics with full QuickDraw 3D RAVE (Renederer Acceleration Virtual Engine) support
- Play arcade-style 3D games and experience virtual reality at home or in cyberspace using QuickDraw 3D acceleration

The following information describes these new multimedia features in more detail and suggests ways you can optimize your machine to get the most out of your new card.

### Using QuickTime Playback

XCLAIM 3D's QuickTime playback acceleration allows you to stretch even the smallest movies to full screen size without compromising frame rate or image quality. XCLAIM 3D's hardware scaler maintains the original quality of your QuickTime movie when scaling to a larger size – even full screen.

XCLAIM 3D's QuickTime playback acceleration displays in millions of colors, even if the current color depth setting is 256 colors or grayscale. When scaling video, XCLAIM 3D uses special hardware techniques (alpha blending and chroma interpolation) to enhance the video quality instead of just repeating pixels.



*To use XCLAIM 3D's playback acceleration, you must have QuickTime version 2.5 or greater installed on your machine. The latest version of QuickTime is included with the Installation CD-ROM.*

### Optimizing Video Playback

When you scale a movie, your system switches from QuickTime's software scaler to XCLAIM 3D's hardware scaler to produce better results. However, QuickTime will not switch to hardware scaling in the following situations:

- playing video in double size  
*Try manually scaling the video slightly off exactly double the size.*
- pausing the video
- using single frame advance
- watching the video in reverse
- playing a video that has not been saved in Cinepak or Indeo compressed format

QuickTime clips must be in Cinepak (the most common QuickTime movie format) or Indeo format to be scaled by XCLAIM 3D. To determine if a video will be accelerated using XCLAIM 3D's hardware scaler, check the video format.

#### To check the format of a video

- 1 Open the movie using Apple Movie Player.
- 2 Select Get Info.
- 3 From the 1st pull down menu, select Video Track.
- 4 From the 2nd pull down menu, select Format.
- 5 Read the format type. Remember, only Cinepak and Indeo formats use XCLAIM 3D's QuickTime acceleration and hardware scaler.





*Some multimedia titles on CD-ROM incorporate QuickTime clips that do not allow movies to be stretched during playback. These QuickTime clips cannot be accelerated while viewing the multimedia title.*

## Viewing 3D Graphics

XCLAIM 3D's QuickDraw 3D Acceleration supports the following advanced 3D graphics capabilities:

- QuickDraw 3D RAVE Support
- Six perspectively correct texture mapping functions
- 16-bit Z-buffering (a process that removes hidden surfaces)
- Flat and Gouraud shading
- Alpha blending and fog effects
- Video texture and texture lighting

These features make it possible to quickly render 3D graphics, produce atmospheric effects, calculate light and color shading, and determine which objects are in the foreground and which are in the background.

XCLAIM 3D only displays 3D graphics in thousands and millions of colors. 3D acceleration is not supported when your color depth is 256 colors because there are too few colors to display complex 3D textures. To change your color depth, use the Monitors feature in the ATI Displays control panel.

You can use the 3D Memory Monitor to see how memory on your XCLAIM 3D is allocated when displaying 3D graphics. This will allow you to optimize 3D performance. You can also adjust the compression of textures using the 3D Texture Compression feature.

### Using the 3D Memory Monitor

When you open 3D graphics on your Mac, run the 3D Memory Monitor to see how your XCLAIM 3D has allocated 3D memory.

To open the 3D Memory Monitor

- 1

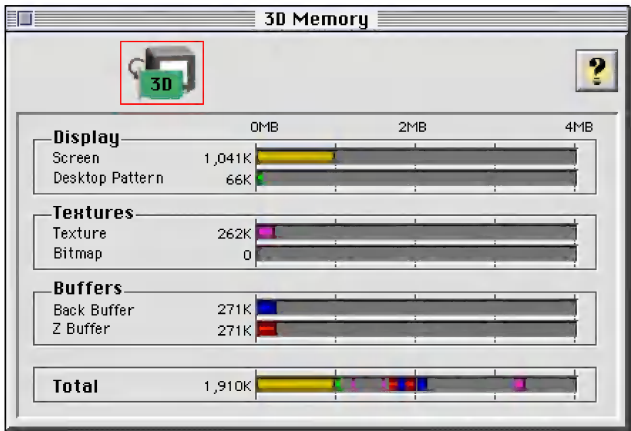
Select Control Panels from the Apple Menu.
- 2

Select ATI Displays.
- 3

Click on the 3D Memory icon.

When you open a 3D application window, you can see how the additional memory required for 3D graphics is allocated.

The 3D Memory Monitor shows you how the memory on your XCLAIM 3D has been allocated between display, textures, and buffers. If you use up all XCLAIM 3D's available memory, your Mac will drop 3D textures and substitute Gouraud shading.



Display

**Screen** indicates the amount of graphics memory allocated to the display's resolution and color depth. **Desktop Pattern** indicates the amount of memory used by your desktop pattern.

To reduce the memory allocated to Display memory:

- change the color depth from millions to thousands
- decrease your screen resolution

### Textures

**Texture** indicates the number and size of texture maps loaded by 3D applications to add realism to 3D models and environments. **Bitmap** indicates the memory allocated to non-3D elements like 2D and video.

To reduce the memory allocated to Texture memory:

- reduce the amount of textures in your 3D graphic
- adjust 3D texture compression (See “Adjusting Texture Compression” on page 23.)

### Buffers

**Back Buffer** and **Z Buffer** are directly related to the size of the 3D window.

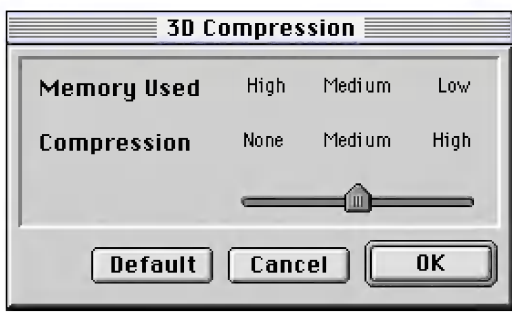
To reduce the memory allocated to Buffer memory:

- reduce the size of the display window containing 3D graphics
- reduce the number of the display windows containing 3D graphics

### Adjusting Texture Compression

When running 3D graphics, 3D textures are loaded into the memory on your XCLAIM 3D card. You can adjust the texture compression to compress the 3D textures in memory. Compressed textures take up less space so that more textures can be loaded.

Setting texture compression to None will give the best image quality, but your 3D textures may take up a lot of memory.



Medium texture compression will compress your 32 bit textures to 16 bit, thus reducing the memory required by a texture in half.

High compression will compress your 32 and 16 bit textures to 8 bit. High texture compression will save the most memory but the loss in data may affect the image quality.



# Troubleshooting Tips

## Before Contacting Customer Support

If you have a general question, or encounter problems with your card, please review this information completely before contacting Customer Support.

You can create a problem report from the ATI Displays control panel. Please refer to the ATI Guide for instructions on generating this problem report, and for general troubleshooting tips not covered in this section.

Before calling about a suspected problem, please complete the problem report, and have the report file either on-screen or printed out for reference during your call. Important information about your system is automatically included when you generate the report.

## Solutions to Common Problems

### Why can't I get a resolution higher than 640x480?



If the monitor is connected to the VGA monitor port on your XCLAIM 3D card...

- go to the ATI Displays control panel, click “VGA Monitors”, and select a monitor type which matches the specifications of your monitor. This allows more resolutions to be available for selection in the standard Monitors control panel.



If the monitor is connected to the Apple monitor port on your XCLAIM 3D card...

- The problem likely relates to Monitor Sensing. Any monitor connected to an Apple-type monitor port must supply “sense code information” so that the graphics card can configure itself for the attached monitor. If the detected sense code does not represent

the capabilities of your monitor, then the card cannot configure itself properly. You need to attach a monitor adapter that supplies the proper sense code for your monitor. Monitor adapters can be obtained from the monitor manufacturer, or from your local Apple Authorized Dealer.

**I am using a monitor adapter to supply the sense code, but I only get one resolution, even though I have a multiscan monitor. Why?**

- If the adapter is configurable, you need to adjust it to one of the multiscan options that best matches your monitor. If the adapter is not configurable, you need a new adapter with the proper sense code for a multiscan monitor.

**I have a monitor with three BNC connectors. Why won't it work with my XCLAIM 3D card?**

- Monitors that only have three BNC connectors require a synchronization (“sync”) signal to be sent down the green line. This is called Sync-on-Green (SOG). ATI accelerator cards do not output an SOG signal. Adapters are available for your Macintosh to convert the separate sync signal from the ATI card to an SOG signal for the monitor. Check with your local Apple Authorized Dealer for availability of SOG adapters.

**I have a monitor with five BNC connectors. Why won't it work with my XCLAIM 3D card?**

- For a cable with five BNC connectors, ensure that they are all connected to the monitor. If only three of the cables are connected (i.e., R, G, and B), the monitor is expecting a Sync-on-Green (SOG) signal.
- Some monitors may have a switch to set the monitor to either SOG or separate sync. If the switch is set to SOG, the monitor will show a scrambled display. Setting the switch to separate / composite sync may resolve the problem.
- A number of BNC cables, even though they are designed for Macintosh computers, do not supply the

sense code needed by the graphics card. Using an adapter which sets the appropriate sense code should solve the problem.

**After selecting a VGA monitor type in the VGA Monitors dialog, I couldn't change the resolution in the Resolutions Supported scroll list.**

- This scroll list in the ATI Displays control panel only shows the available resolutions for the monitor type selected, and will not allow you to select and change resolutions. Changing resolutions can only be done through the standard Monitors & Sound control panel, or by using the Popup Menu supplied with the XCLAIM 3D card.

**Can the XCLAIM 3D work in all Power Macintosh computers?**

- No, the XCLAIM 3D only works with PCI-based Power Macintosh computers. The minimum system requirements for the XCLAIM 3D are:
  - a) Power Macintosh with PCI expansion slots,
  - b) Macintosh System Software version 7.5.2 or later,
  - c) Apple monitor or VGA-style monitor that supports a minimum resolution of 640x480, with a minimum refresh rate of 60Hz.
  - d) QuickTime 2.5 or later (included)
  - e) QuickDraw 3D 1.5 or later (included)
  - f) Minimum 16MB memory (QuickDraw 3D requires 16MB of memory)

**Where can I get a memory module upgrade for my XCLAIM 3D card?**

- Memory upgrade modules are available either from your dealer, or they can be purchased directly from ATI. For information about contacting ATI, click the ATI icon in the Displays control panel.





B

Specifications

Video Mode Table

The video mode table below lists the color depth capabilities for the supported resolutions on your XCLAIM 3D card.



*Although upgrading the memory on your XCLAIM 3D card to 6MB or 8MB gives essentially the same color depths and resolutions, it does significantly increase the number of 3D windows that can be open at one time. See “3D Mode Table” on page 30 and “Memory Upgrade” on page 30 for more information.*

Please consult your monitor’s specifications to determine which resolutions are available with your display.

Color depth is measured in bits per pixel (bpp):

- 8 bpp = 256 colors
- 16 bpp = thousands (32,768 colors)
- 32 bpp = millions (16.7 million colors)

Display Resolution	Vertical Refresh Hz	Maximum Colors at 4MB	Maximum Colors at 6MB / 8MB
512 x 384	70	millions	millions
640 x 480	60, 67, 72, 75, 85, 90, 100, 120	millions	millions
640 x 870	75	millions	millions
800 x 600	56, 60, 72, 75, 85, 90, 100, 120	millions	millions
832 x 624	75	millions	millions
1024 x 768	60, 70, 75, 85, 90	millions	millions
1024 x 768	100, 120	thousands	thousands
1152 x 870	75	millions	millions
1280 x 960	75	thousands	thousands
1280 x 1024	60	thousands	millions
1280 x 1024	75, 85	thousands	thousands
1600 x 1200	60, 65, 70, 75	thousands	thousands

### 3D Mode Table

The 3D mode table measures the number of full screen 3D windows that are possible to display at a given resolution. For example, a value of 2.75 means that there is enough memory left over in the current mode to run 2 full screen 3D windows and another at 3/4 the size of full screen. A value of 0.40 means that largest 3D window will be just less than 1/2 the size of full screen.

In the following table, 3D windows are considered to use a back buffer and Z buffer and no texture compression. You could increase the number of full screen 3D windows possible by using texture compression.



*3D acceleration is not supported when your color depth is 256 colors. In this color depth, there are too few colors to display complex 3D textures.*

Full screen 3D windows possible				
Resolution	Colors	4MB	6MB	8MB
512 x 384	Thousands	4.50	7.25	10.00
512 x 384	Millions	2.75	4.50	6.25
640 x 480	Thousands	2.75	4.50	6.25
640 x 480	Millions	1.50	2.50	3.75
800 x 600	Thousands	1.50	2.75	3.75
800 x 600	Millions	0.75	1.50	2.25
832 x 624	Thousands	1.50	2.50	3.50
832 x 624	Millions	0.60	1.25	2.00
1024 x 768	Thousands	0.75	1.50	2.00
1024 x 768	Millions	–	0.50	1.00
1152 x 870	Thousands	0.50	1.00	1.50
1152 x 870	Millions	–	0.25	0.75

### Memory Upgrade

If you currently have a 4MB XCLAIM 3D card, you can upgrade to 6MB by adding a 2MB upgrade module, or to 8MB by adding a 4MB module.

A 6MB or 8MB XCLAIM 3D card gives you essentially the same color depths and resolutions, but significantly more

3D windows at one time. See the “Video Mode Table” on page 29 to determine which resolutions and color depths are available for your monitor with 4MB, 6MB, or 8MB of memory. See the “3D Mode Table” on page 30 to determine the number of full screen 3D windows your card will support at one time.

Please consult your monitor’s specifications to determine which resolutions are available with your display.

To obtain a memory module upgrade, please contact ATI or your dealer. For information about contacting ATI, click the ATI icon in the ATI Displays control panel.

## Specifications

### System Requirements

- Power Macintosh with PCI.

### Operating System

- Macintosh System software (version 7.5.2 or higher).
- QuickTime (version 2.5 or higher).
- QuickDraw 3D (version 1.5 or higher).

### Graphics Controller

- ATI 3D RAGE II — 64-bit graphics and multimedia accelerator chip.

### Video Display Buffer

- 4MB memory upgradeable to 6MB or 8MB.
- 64-bit memory interface.

### Bus

- 32-bit PCI local bus compliant with PCI version 2.0 specification.

## Sync Signals

- Separate horizontal and vertical sync at TTL levels.
- Composite sync at TTL levels.

## Video Memory Address

- Supports PCI Multimedia Standard.
- Supports 16MB relocatable memory aperture.

## Display Connector

- Apple Connector - Apple DB-15
- VGA Connector - Standard VGA

## Video Interrupt

- PCI interrupt request enabled; interrupt is auto configured by system.

## Power

- +5V +/- 5%, @ 1.3A typical.

## Environment

- Ambient Temperature: 50° to 122° F (10° to 50° C) operation. 32° to 162° F (0° to 70° C) storage.
- Relative Humidity: 5% to 90% non-condensing operation. 0% to 95% storage.

## MTBF

- 120,000 hours.

## EMC Certification

- FCC Class B

## Safety

- PCB made from UL-listed flame retardant material.



# Compliance Information

## FCC Compliance Information

This device is in conformity with part 15 of the FCC Rules. Operation of this product is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with manufacturer's instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Re-orient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment to an outlet on a circuit different from that to which the receiver is connected.

Consult the dealer or an experienced technician for help.

- The use of shielded cables for connection of the monitor to the graphics card is required to ensure compliance with FCC regulations.
- Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

### Industry Canada Compliance Statement

ICES-003 This Class B digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique de la Classe B Respecte toutes les exigences du Règlement sur le matériel brouiller du Canada.

### CE Compliance Information

EMC Directive 89/336/EEC and Amendment 92/31/EEC, Class B Digital Device

EN 50081-1, Generic Emissions Standard for Residential, Commercial and Light Industrial Products

(EN 55022/CISPR 22, Limits and Methods of Measurement of Radio Interference Characteristics Information Technology Equipment) *Warning: This is a Class B product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.*

EN 50082-1, Generic Immunity Standard for Residential, Commercial and Light Industrial Products

(IEC 801-2, IEC 801-3, IEC 801-4)

Directive EMC 89/336/CEE et amendement 92/31/CEE,  
dispositif numérique de Classe B

EN 50081-1, Norme sur les émissions génériques pour les  
produits domestiques, commerciaux et industriels légers

(EN 55022/CISPR 22, Limites et méthodes de mesure des  
caractéristiques d'interférences radiophoniques, Matériel  
des technologies de l'information) *Mise en garde: ceci est un  
produit de Classe B. Il risque produire des interférences  
radiophoniques dans un environnement domestique auquel cas  
l'utilisateur peut se voir demandé de prendre des mesures  
adéquates.*

EN 50082-1, Norme sur l'immunité générique pour  
produits domestiques, commerciaux et industriels légers.

(CEI 801-2, CEI 801-3, CEI 801-4)

EMC Richtlinie 89/336/EEC und Änderung 92/31/EEC,  
Digitales Gerät der Klasse B

EN 50081-1, Allgemeiner Emissions-Standard für  
Haushalt- und kommerzielle Produkte sowie Erzeugnisse  
der Leichtindustrie

(EN 55022/CISPR 22, Beschränkungen und Verfahren der  
Messung von informationstechnischen Ausrüstungen mit  
Funkstörmerkmalen)

Warnung: Dies ist ein Erzeugnis der Klasse B. Dieses  
Erzeugnis kann Funkstörungen im Wohnbereich  
verursachen; in diesem Fall können entsprechende  
Maßnahmen seitens des Benutzers erforderlich sein.

EN 50082-1. Allgemeiner Unempfindlichkeits-Standard  
für Haushalt- und kommerzielle Produkte sowie  
Erzeugnisse der Leichtindustrie

(IEC 801-2, IEC 801-3, IEC 801-4)

